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08/567,886	12/08/95	SOUTAR	A A0626/7001

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A1M1/0603

EXAMINER	
TALBOT, B	
ART UNIT	PAPER NUMBER
	1112 5

DATE MAILED:

06/03/96

Attached

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

A shortened statutory period for response to this action
is set to expire three months(s), or thirty days,
whichever is longer, from the date of this communication.

Office Action Summary

Application No.
08/567,886

Applicant(s)
Soutar et al.

Examiner
Brian K. Talbot

Group Art Unit
1112



☒ Responsive to communication(s) filed on Mar 12, 1996

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-33 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-33 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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Claim Rejections - 35 USC § 112

1. Claims 1-3,8,14,19,26-29 and 31 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 1 and 18,
the term "multidentate" is unclear. Clarification is requested.

With respect to claim 2,
the term "preferably" is indefinite.

With respect to claim 3,
the phrase "a copper surface" lacks antecedent basis.

With respect to claim 8,
the term "the displacement coating composition" lacks antecedent basis. Additionally,
the claim is confusing. Does the coating composition include a surfactant, wetting
agent, etc.? The claim as written states that the displacement coating is a surfactant,
wetting agent, etc.

With respect to claim 14,
it appears that the term "step" has been left out between the terms "to" and "(a)".

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With respect to claim 19,
the elements in the Markush group are not mutually exclusive as required. The term ammonia includes ammonium ions. Appropriate correction is required.

With respect to claim 26,
it appears that the term "°C" has been left out between the terms "15" and "to".

With respect to claims 27 and 31,
the phrase "40°C/93% RH" is confusing. What does the "/" represent? What does RH represent.

With respect to claims 28 and 29,
the term "the layer of metal plating" lacks antecedent basis. Which metal? Copper? Silver? Both?

With respect to claim 31,
the term "40°" is unclear. Is the temperature measure in Celsius, Fahrenheit, etc.?

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Evaluations of the level of ordinary skill in the art requires consideration of such factors as various prior art approaches, types of problems encountered in the art, rapidity with which innovations are made, sophistication of technology involved, educational background of those actively working in the field, commercial success, and failure of others.

The "person having ordinary skill" in this art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The evidence of record including the references and/or the admissions are considered to reasonably reflect this level of skill.

Claims 1,3-7,10-16 and 21-3³~~2~~ are rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845).

Greenberg et al. (3,993,845) teaches novel copper-silver metallic films prepared on transparent articles by chemical replacement of silver for copper. According to the method the transparent article is coated with copper by conventional methods of deposition. The copper article is then contacted by a solution comprising a silver salt, ammonia and a complexing agent which promotes replacement but which does not accelerate the oxidation of residual metallic copper in the film (see abstract). The surface of the substrate to be coated is first cleaned by conventional cleaning

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procedures (col. 2, line 67 - col. 3, line 2). The complexing agent utilized includes ethylenediamine tetra acetic acid (col. 3, lines 9-14). The concentration of silver nitrate is typically between 0.5 to 5.0 grams (col. 5, lines 29-35) or approximately 1 gram/l (see Examples). The concentration of complexing agent is from 1 to 8 grams/liter and depends upon the type utilized (col. 5, lines 35-45). The replacement solution is maintained in contact with the film at room temperature, i.e. 23°C, for a period of from less than one minute to five minutes (col. 5, lines 45-50) and can be in the range of 20°C to 90°C (col. 6, lines 62-65). The replacement solution is then rinsed from the article and dried with air (col. 5, lines 53-55).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Greenberg et al.'s (3,993,845) silver replacement solution to have a pH in the range claimed by applicant because it is within the purview of one skilled in the art to obtain the optimal pH range through routine experimentation and that the pH is known to be a "cause effective" variable.

It is noted that claim 13 recites a specific thickness, i.e. 0.5 micrometers. It is the examiner's position that thickness is a "cause effective" variable and it would have been obvious to one skilled in the art at the time the invention was made to have obtained the optimal thickness through routine experimentation.

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Claims 2,17 and 18 and 21-3³~~2~~ are rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845) in view of Applicant's admitted state of the art (specification, pg. 1, line 8 - pg. 9, lines 26).

Features described above in rejecting claims 1,3-7,10-16 and 21-3³~~2~~ over Greenberg et al. (3,993,845) are incorporated here.

Greenberg et al. (3,993,845) fails to teach silver plating metal conductive pads, through holes and combinations thereof with the aid of masks for covering the areas desired to remain free of silver coating.

Applicant's admitted state of the art (specification, pg. 1, line 8 - pg. 9, lines 26) teaches that it is well known to utilize silver coating on copper substrates for protecting the copper from oxidation with the use of masks.

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have utilized Greenberg et al.'s (3,993,845) silver replacement process for depositing silver on copper in Applicant's admitted state of the art (specification, pg. 1, line 8 - pg. 9, lines 26) printed circuit board construction because one skilled in the art would want to obtain the benefits associated with such a process, i.e. less oxidation of the copper surface as evidenced by Greenberg et al. (3,993,845).

Claims 8,9,20 are rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845) in view of Leahy et al. (4,067,784).

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Features described above in rejecting claims 1,3-7,10-16 and 21-32³ over Greenberg et al. (3,993,845) are incorporated here.

Greenberg et al. (3,993,845) fails to teach incorporating surfactants, buffers, etc. in the silver plating solution.

Leahy et al. (4,067,784) teaches a non-cyanide acidic silver plating bath which incorporates a buffer and a surfactant. Additionally, the plating solution can contain brighteners and other additives known to those skilled in the art (col. 2, lines 25-65).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Greenberg et al.'s (3,993,845) silver plating solution by incorporating additives such as buffers and surfactants because one skilled in the art would want to obtain the benefits associated with their use as evidenced by Leahy et al. (4,067,784).

Claims 19 is rejected under 35 U.S.C. § 103 as being unpatentable over Greenberg et al. (3,993,845) in view of Mandich et al. (5,322,553).

Features described above in rejecting claims 1,3-7,10-16 and 21-32³ over Greenberg et al. (3,993,845) are incorporated here.

Greenberg et al. (3,993,845) fails to teach a silver plating solution which is free of ammonia, formaldehyde, cyanide, etc.

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Mandich et al. (5,322,553) teaches electroless plating compositions which do not contain ammonia, formaldehyde, cyanide, etc. Mandich et al. (5,322,553) teaches that formaldehyde does not make the plating bath stable or commercially useful on a large scale, the use of ammonia either as a stabilizer, a main complexing agent or both is known to be very shock sensitive explosives when dried (col. 1, lines 10-30). The plating solution may also be cyanide-free (col. 1, lines 59-61).

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Greenberg et al.'s (3,993,845) silver plating solution by making the plating solution free of formaldehyde, cyanide, and ammonia as suggested by Mandich et al. (5,322,553) because one skilled in the art would want to avoid the problems associated with their use as evidenced above.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (703) 305-3775.

Brian K Talbot

bkt

May 29, 1996

[Signature]
SHINHEE DECK
SUPERVISORY PATENT EXAMINER
GROUP 1100